

#5

Sequence Listing

<110> Prof. Dr. Flügge, Ulf-Ingo

<120> DNA-Sequences, which code a glucose-translocator,
Plasmids, Bacteria, Yeasts and Plants containing
This Tranlocator

<130> plastidic glucose transporters

<140> 09/719,168

<141>

<150> 5652952

<151> 1999-06-13

<160> 6

<170> PatentIn Ver. 2.1

<210> 1

<211> 1874

<212> DNA

<213> Zea mays

<220>

<221> CDS

<222> (2)..(1630)

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<221> 3'UTR

<222> (1631)..(1874)

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tcg	tgg	agc	ggc	gat	cgg	aga	ttg	ccg	gcg	gtc	aac	ccc	tgc	agc	gtg	97
Ser	Trp	Ser	Gly	Asp	Arg	Arg	Leu	Pro	Ala	Val	Asn	Pro	Cys	Ser	Val	
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cg	gg	at	cc	ac	gg	at	gg	tg	tg	gc	gg	ct	gg	ag	tg	cg	145
Arg	Met	Pro	Thr	Gly	Asn	Asp	Gly	Trp	Cys	Ala	Gly	Leu	Arg	Ser	Arg		
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gc	gc	gat	ct	gc	gg	ct	gag	at	gc	aa	ct	cg	gg	gg	gt	193
Ala	Ala	Asp	Leu	Ala	Gly	Leu	Glu	Met	Ala	Asn	Leu	Arg	Gly	Gly	Val	
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gg	gg	ct	tt	cg	gc	ag	cc	cg	cg	tac	gg	cg	tt	ca	gg	ac	241
Gly	Gly	Leu	Phe	Arg	Ala	Ser	Pro	Arg	Tyr	Gly	Arg	Leu	Gln	Ala	Thr		
65										70					80		

gc	gc	gt	gac	cct	gaa	gat	att	cc	tt	gag	aag	gtt	ca	gg	ac	289
Ala	Ala	Val	Asp	Pro	Glu	Asp	Ile	Pro	Leu	Glu	Lys	Val	Gln	Val	Lys	
85										90					95	

tcc	tca	gga	cat	gtt	ct	cc	tat	gtt	ggc	gtt	gct	tgt	tt	gg	gt	337
Ser	Ser	Gly	His	Val	Leu	Pro	Tyr	Val	Gly	Val	Ala	Cys	Leu	Gly	Ala	
100										105					110	

att	ctg	ttt	ggt	tac	cat	ctt	ggt	gt	gtc	aat	ggc	gca	ctt	gaa	tat	385
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Ile	Leu	Phe	Gly	Tyr	His	Leu	Gly	Val	Val	Asn	Gly	Ala	Leu	Glu	Tyr	
115						120					125					
ctc	gct	aag	gat	ctt	ggg	att	gct	gaa	aat	gct	gtc	ttg	cag	ggg	tgg	433
Leu	Ala	Lys	Asp	Leu	Gly	Ile	Ala	Glu	Asn	Ala	Val	Leu	Gln	Gly	Trp	
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gtg	gtt	agc	aca	tcc	ttg	gct	ggt	gca	aca	cta	ggt	tct	ttt	act	ggg	481
Val	Val	Ser	Ser	Leu	Ala	Gly	Ala	Thr	Leu	Gly	Ser	Phe	Thr	Gly		
145						150				155			160			
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Gly	Ser	Leu	Ala	Asp	Lys	Phe	Gly	Arg	Thr	Arg	Thr	Phe	Ile	Leu	Asp	
165						170				175						
gca	gtc	cca	ctt	gct	cta	ggt	gca	ttc	ttg	agt	gca	aca	gct	caa	gat	577
Ala	Val	Pro	Leu	Ala	Leu	Gly	Ala	Phe	Leu	Ser	Ala	Thr	Ala	Gln	Asp	
180						185				190						
atc	cgc	aca	atg	att	att	ggc	cga	ttg	ctt	gct	gga	att	ggt	atc	ggg	625
Ile	Arg	Thr	Met	Ile	Ile	Gly	Arg	Leu	Leu	Ala	Gly	Ile	Gly	Ile	Gly	
195						200				205						
gtc	tca	tct	gct	ctt	gta	ccc	ctt	tac	ata	tct	gag	atc	tca	cca	act	673
Val	Ser	Ser	Ala	Leu	Val	Pro	Leu	Tyr	Ile	Ser	Glu	Ile	Ser	Pro	Thr	
210						215				220						
gaa	att	cgt	gga	aca	ctt	ggt	acc	gtt	aat	caa	ctt	ttt	att	tgc	att	721
Glu	Ile	Arg	Gly	Thr	Leu	Gly	Thr	Val	Asn	Gln	Leu	Phe	Ile	Cys	Ile	
225						230				235			240			
gga	att	ctt	gca	gct	ttg	tta	gct	gga	ttg	cct	ctg	gca	gga	aat	cct	769
Gly	Ile	Leu	Ala	Ala	Leu	Leu	Ala	Gly	Leu	Pro	Leu	Ala	Gly	Asn	Pro	
245						250				255						
gcc	tgg	tgg	agg	aca	atg	ttt	gga	att	gct	gta	gtt	cca	tcc	att	ctg	817
Ala	Trp	Trp	Arg	Thr	Met	Phe	Gly	Ile	Ala	Val	Val	Pro	Ser	Ile	Leu	
260						265				270						
ctg	gct	gta	gga	atg	gcc	ttt	tcg	cct	gaa	agc	cct	cgt	tgg	cta	tcc	865
Leu	Ala	Val	Gly	Met	Ala	Phe	Ser	Pro	Glu	Ser	Pro	Arg	Trp	Leu	Phe	
275						280				285						
cag	caa	gga	aag	gtt	act	caa	gca	gaa	tta	gct	gta	aaa	aga	ctg	tat	913
Gln	Gln	Gly	Lys	Val	Thr	Gln	Ala	Glu	Leu	Ala	Val	Lys	Arg	Leu	Tyr	
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Gly	Lys	Glu	Met	Val	Thr	Glu	Ile	Met	Phe	Asp	Leu	Arg	Ala	Ser	Gly	
305						310				315			320			
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Gln	Ser	Ser	Ser	Glu	Ser	Glu	Ala	Gly	Trp	Phe	Asp	Leu	Phe	Ser	Lys	
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cgt	tac	tgg	aaa	gtt	gtg	agt	gtg	ggg	gca	gca	ctg	ttt	ttg	ttc	cag	1057
Arg	Tyr	Trp	Lys	Val	Val	Ser	Val	Gly	Ala	Ala	Leu	Phe	Leu	Phe	Gln	
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Gln	Leu	Ala	Gly	Ile	Asn	Ala	Val	Val	Tyr	Tyr	Ser	Thr	Ser	Val	Phe	
355						360				365						

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Arg Ser Ala Gly Ile Ala Ser Asp Val Ala Ala Ser Ala Leu Val Gly	
370 375 380	
gca gcc aat gtt ttt ggt act atg gtt gca tct tct cta atg gac aaa	1201
Ala Ala Asn Val Phe Gly Thr Met Val Ala Ser Ser Leu Met Asp Lys	
385 390 395 400	
caa gga agg aaa agc ctt ctg ata aca agc ttt tct gga atg ggt gct	1249
Gln Gly Arg Lys Ser Leu Leu Ile Thr Ser Phe Ser Gly Met Gly Ala	
405 410 415	
tca atg cta ctc cta gca ttg tcc ttc acc tgg aaa gct ctg gca cct	1297
Ser Met Leu Leu Leu Ala Leu Ser Phe Thr Trp Lys Ala Leu Ala Pro	
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tat tct ggt act ctt gct gtt ggc act gtt ctg tac gtg ctg tca	1345
Tyr Ser Gly Thr Leu Ala Val Val Gly Thr Val Leu Tyr Val Leu Ser	
435 440 445	
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Phe Ala Leu Gly Ala Gly Pro Val Pro Ala Leu Leu Leu Pro Glu Ile	
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Phe Ala Ser Arg Ile Arg Ala Lys Ala Val Ala Leu Ser Leu Gly Met	
465 470 475 480	
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His Trp Val Ser Asn Phe Phe Ile Gly Leu Tyr Phe Leu Ser Val Val	
485 490 495	
agc aag ttt ggg atc agc aac gtg tat ctg gga ttt gca tca gta tgt	1537
Ser Lys Phe Gly Ile Ser Asn Val Tyr Leu Gly Phe Ala Ser Val Cys	
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gcc ctt gca gtt ctg tac ata gct ggg aat gtg gtc gag acc aag ggg	1585
Ala Leu Ala Val Leu Tyr Ile Ala Gly Asn Val Val Glu Thr Lys Gly	
515 520 525	
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Arg Ser Leu Glu Glu Ile Glu Arg Glu Leu Ser Val Ala Glu	
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caaccgagca tccttgacc tggagactct ttctagttc atgttagttt agaaataagc	1750
gaacggcaag agtaccaatc ttaggtgact tgggtgggt tggctgaa ataagtgaat	1810
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aaaaa	1874

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 <213> Zea mays

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35 40 45

Ala Ala Asp Leu Ala Gly Leu Glu Met Ala Asn Leu Arg Gly Gly Val
50 55 60

Gly Gly Leu Phe Arg Ala Ser Pro Arg Tyr Gly Arg Leu Gln Ala Thr
65 70 75 80

Ala Ala Val Asp Pro Glu Asp Ile Pro Leu Glu Lys Val Gln Val Lys
85 90 95

Ser Ser Gly His Val Leu Pro Tyr Val Gly Val Ala Cys Leu Gly Ala
100 105 110

Ile Leu Phe Gly Tyr His Leu Gly Val Val Asn Gly Ala Leu Glu Tyr
115 120 125

Leu Ala Lys Asp Leu Gly Ile Ala Glu Asn Ala Val Leu Gln Gly Trp
130 135 140

Val Val Ser Thr Ser Leu Ala Gly Ala Thr Leu Gly Ser Phe Thr Gly
145 150 155 160

Gly Ser Leu Ala Asp Lys Phe Gly Arg Thr Arg Thr Phe Ile Leu Asp
165 170 175

Ala Val Pro Leu Ala Leu Gly Ala Phe Leu Ser Ala Thr Ala Gln Asp
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Ile Arg Thr Met Ile Ile Gly Arg Leu Leu Ala Gly Ile Gly Ile Gly
195 200 205

Val Ser Ser Ala Leu Val Pro Leu Tyr Ile Ser Glu Ile Ser Pro Thr
210 215 220

Glu Ile Arg Gly Thr Leu Gly Thr Val Asn Gln Leu Phe Ile Cys Ile
225 230 235 240

Gly Ile Leu Ala Ala Leu Leu Ala Gly Leu Pro Leu Ala Gly Asn Pro
245 250 255

Ala Trp Trp Arg Thr Met Phe Gly Ile Ala Val Val Pro Ser Ile Leu
260 265 270

Leu Ala Val Gly Met Ala Phe Ser Pro Glu Ser Pro Arg Trp Leu Phe
275 280 285

Gln Gln Gly Lys Val Thr Gln Ala Glu Leu Ala Val Lys Arg Leu Tyr
290 295 300

Gly Lys Glu Met Val Thr Glu Ile Met Phe Asp Leu Arg Ala Ser Gly
305 310 315 320

Gln Ser Ser Ser Glu Ser Glu Ala Gly Trp Phe Asp Leu Phe Ser Lys
325 330 335

Arg Tyr Trp Lys Val Val Ser Val Gly Ala Ala Leu Phe Leu Phe Gln
340 345 350

Gln Leu Ala Gly Ile Asn Ala Val Val Tyr Tyr Ser Thr Ser Val Phe
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 Arg Ser Ala Gly Ile Ala Ser Asp Val Ala Ala Ser Ala Leu Val Gly
 370 375 380
 Ala Ala Asn Val Phe Gly Thr Met Val Ala Ser Ser Leu Met Asp Lys
 385 390 395 400
 Gln Gly Arg Lys Ser Leu Leu Ile Thr Ser Phe Ser Gly Met Gly Ala
 405 410 415
 Ser Met Leu Leu Leu Ala Leu Ser Phe Thr Trp Lys Ala Leu Ala Pro
 420 425 430
 Tyr Ser Gly Thr Leu Ala Val Val Gly Thr Val Leu Tyr Val Leu Ser
 435 440 445
 Phe Ala Leu Gly Ala Gly Pro Val Pro Ala Leu Leu Leu Pro Glu Ile
 450 455 460
 Phe Ala Ser Arg Ile Arg Ala Lys Ala Val Ala Leu Ser Leu Gly Met
 465 470 475 480
 His Trp Val Ser Asn Phe Phe Ile Gly Leu Tyr Phe Leu Ser Val Val
 485 490 495
 Ser Lys Phe Gly Ile Ser Asn Val Tyr Leu Gly Phe Ala Ser Val Cys
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 Asp Ala Ala Pro Leu Lys Val Gln Gln Ser Ser Gly Ser Val Leu
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 ccc tat gtg ggt gta gct tgt ctg gga gca att tta ttt gga tat cac 144
 Pro Tyr Val Gly Val Ala Cys Leu Gly Ala Ile Leu Phe Gly Tyr His

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cta ggg gtg gtg aat ggt gcc ctt gag tac cta gct aag gat ctt gga	192
Leu Gly Val Val Asn Gly Ala Leu Glu Tyr Leu Ala Lys Asp Leu Gly	
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att gcc gag aac act gtt ata caa gga tgg att gtt agc aca gtt ctt	240
Ile Ala Glu Asn Thr Val Ile Gln Gly Trp Ile Val Ser Thr Val Leu	
65 70 75 80	
gct ggc gcc ttt gtt ggt tca ttt act ggt gga gtt ctg gct gat aaa	288
Ala Gly Ala Phe Val Gly Ser Phe Thr Gly Gly Val Leu Ala Asp Lys	
85 90 95	
ttt ggc cga aca aag aca ttt ata ttg gat gca att cca ctt tca gtt	336
Phe Gly Arg Thr Lys Thr Phe Ile Leu Asp Ala Ile Pro Leu Ser Val	
100 105 110	
ggt gcg ttt cta tgt acc act gcc cag agt gtt cag gct atg atc att	384
Gly Ala Phe Leu Cys Thr Thr Ala Gln Ser Val Gln Ala Met Ile Ile	
115 120 125	
gga cgc tta ctt act gga att ggc att ggc atc tca tct gct att gtg	432
Gly Arg Leu Leu Thr Gly Ile Gly Ile Gly Ser Ser Ala Ile Val	
130 135 140	
cca ctt tac ata tct gag atc tca ccc act gaa att cgc ggc aca ctg	480
Pro Leu Tyr Ile Ser Glu Ile Ser Pro Thr Glu Ile Arg Gly Thr Leu	
145 150 155 160	
gga acg gtc aat cag cta ttc att tgc att gga att ctt gtt gca ctc	528
Gly Thr Val Asn Gln Leu Phe Ile Cys Ile Gly Ile Leu Val Ala Leu	
165 170 175	
gtg gtt gga ttg cct ttg tct gga aat cct tcg tgg tgg aga aca atg	576
Val Val Gly Leu Pro Leu Ser Gly Asn Pro Ser Trp Trp Arg Thr Met	
180 185 190	
ttt ggt ctc gca ctt att cca tct gtt tta ctt gca ata gga atg gca	624
Phe Gly Leu Ala Leu Ile Pro Ser Val Leu Ala Ile Gly Met Ala	
195 200 205	
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Phe Ser Pro Glu Ser Pro Arg Trp Leu Tyr Gln Gln Gly Arg Ile Ser	
210 215 220	
gaa gct gag aca tct att aaa agg cta tat ggt aaa gaa aaa gtt gct	720
Glu Ala Glu Thr Ser Ile Lys Arg Leu Tyr Gly Lys Glu Lys Val Ala	
225 230 235 240	
gag gtt atg ggt gac ttg gaa gct tct gcc cgg ggt tct tca gaa cca	768
Glu Val Met Gly Asp Leu Glu Ala Ser Ala Arg Gly Ser Ser Glu Pro	
245 250 255	
gat gct ggg tgg ctt gat cta ttt agt agc cgt tat agg aaa gtt gtt	816
Asp Ala Gly Trp Leu Asp Leu Phe Ser Ser Arg Tyr Arg Lys Val Val	
260 265 270	
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Ser Ile Gly Ala Ala Met Phe Leu Leu Gln Gln Leu Ala Gly Ile Asn	
275 280 285	
gct gtt gtc tat tat tcc act gcc gtg ttc cgg agt gct gga att aca	912

Ala Val Val Tyr Tyr Ser Thr Ala Val Phe Arg Ser Ala Gly Ile Thr	290	295	300	
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Ser Asp Val Ala Ala Ser Ala Leu Val Gly Ala Ala Asn Val Phe Gly				
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aca acg gtg gca tcc tct ttg atg gac aaa caa gga agg aag agt ctc				1008
Thr Thr Val Ala Ser Ser Leu Met Asp Lys Gln Gly Arg Lys Ser Leu				
325	330	335		
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Leu Leu Ile Ser Tyr Thr Gly Met Ala Ala Ser Met Met Leu Leu Ser				
340	345	350		
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Leu Ser Phe Thr Trp Lys Val Leu Thr Pro Tyr Ser Gly Thr Leu Ala				
355	360	365		
gtt ctt ggt act gtc ctc tat gtg ttg tcc ttt tca ctt ggt gct ggt				1152
Val Leu Gly Thr Val Leu Tyr Val Leu Ser Phe Ser Leu Gly Ala Gly				
370	375	380		
cct gtg cct gct ctt cta ctt cca gaa ata ttt gct tcc aga att agg				1200
Pro Val Pro Ala Leu Leu Pro Glu Ile Phe Ala Ser Arg Ile Arg				
385	390	395	400	
gca aaa gcg gtg gct ctc tct ttg ggg gta cat tgg ata atg aac ttc				1248
Ala Lys Ala Val Ala Leu Ser Leu Gly Val His Trp Ile Met Asn Phe				
405	410	415		
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Phe Ile Gly Leu Tyr Phe Leu Ser Ile Val Thr Lys Phe Gly Ile Ser				
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Thr Val Tyr Met Gly Phe Ala Leu Ser Cys Leu Val Ala Val Val Tyr				
435	440	445		
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Ile Thr Gly Asn Val Val Glu Thr Lys Gly Arg Ser Leu Glu Glu Ile				
450	455	460		
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Glu Arg Glu Leu Ser Pro Ala Ile				
465	470			
gagagtaatt tcagattccg ccatccagtg ggtcttgatt ttgaagagat tctccacatt				1499
gggagttcta ttattgcgag actggagttg catcaactac ccttagcta tctttgtat				1559
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Pro Tyr Val Gly Val Ala Cys Leu Gly Ala Ile Leu Phe Gly Tyr His
35 40 45

Leu Gly Val Val Asn Gly Ala Leu Glu Tyr Leu Ala Lys Asp Leu Gly
50 55 60

Ile Ala Glu Asn Thr Val Ile Gln Gly Trp Ile Val Ser Thr Val Leu
65 70 75 80

Ala Gly Ala Phe Val Gly Ser Phe Thr Gly Gly Val Leu Ala Asp Lys
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Phe Gly Arg Thr Lys Thr Phe Ile Leu Asp Ala Ile Pro Leu Ser Val
100 105 110

Gly Ala Phe Leu Cys Thr Thr Ala Gln Ser Val Gln Ala Met Ile Ile
115 120 125

Gly Arg Leu Leu Thr Gly Ile Gly Ile Gly Ser Ser Ala Ile Val
130 135 140

Pro Leu Tyr Ile Ser Glu Ile Ser Pro Thr Glu Ile Arg Gly Thr Leu
145 150 155 160

Gly Thr Val Asn Gln Leu Phe Ile Cys Ile Gly Ile Leu Val Ala Leu
165 170 175

Val Val Gly Leu Pro Leu Ser Gly Asn Pro Ser Trp Trp Arg Thr Met
180 185 190

Phe Gly Leu Ala Leu Ile Pro Ser Val Leu Leu Ala Ile Gly Met Ala
195 200 205

Phe Ser Pro Glu Ser Pro Arg Trp Leu Tyr Gln Gln Gly Arg Ile Ser
210 215 220

Glu Ala Glu Thr Ser Ile Lys Arg Leu Tyr Gly Lys Glu Lys Val Ala
225 230 235 240

Glu Val Met Gly Asp Leu Glu Ala Ser Ala Arg Gly Ser Ser Glu Pro
245 250 255

Asp Ala Gly Trp Leu Asp Leu Phe Ser Ser Arg Tyr Arg Lys Val Val
260 265 270

Ser Ile Gly Ala Ala Met Phe Leu Leu Gln Gln Leu Ala Gly Ile Asn
275 280 285

Ala Val Val Tyr Tyr Ser Thr Ala Val Phe Arg Ser Ala Gly Ile Thr
290 295 300

Ser Asp Val Ala Ala Ser Ala Leu Val Gly Ala Ala Asn Val Phe Gly
305 310 315 320

Thr Thr Val Ala Ser Ser Leu Met Asp Lys Gln Gly Arg Lys Ser Leu
325 330 335

Leu Leu Ile Ser Tyr Thr Gly Met Ala Ala Ser Met Met Leu Leu Ser

340

345

350

Leu Ser Phe Thr Trp Lys Val	Leu Thr Pro Tyr Ser	Gly Thr Leu Ala	
355	360	365	
Val Leu Gly Thr Val Leu Tyr Val	Leu Ser Phe Ser	Leu Gly Ala Gly	
370	375	380	
Pro Val Pro Ala Leu	Leu Pro Glu Ile	Phe Ala Ser Arg Ile Arg	
385	390	395	400
Ala Lys Ala Val Ala Leu Ser	Leu Gly Val His	Trp Ile Met Asn Phe	
405	410	415	
Phe Ile Gly Leu Tyr Phe	Leu Ser Ile Val Thr	Lys Phe Gly Ile Ser	
420	425	430	
Thr Val Tyr Met Gly Phe	Ala Leu Ser Cys	Leu Val Ala Val Val Tyr	
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Met Gln Ala Ser Thr Phe Met Val Lys Gly Asn Leu Gly Phe Glu Val	
1 5 10 15	

cag aac cgt aga gtg gct ggg ctt gct ggg ttg aaa ggg tta agc tca	156
Gln Asn Arg Arg Val Ala Gly Leu Ala Gly Leu Lys Gly Leu Ser Ser	
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atc cgt tcc aat aat cta agt ttt gtg aat gtt aat gac aat aat tat	204
Ile Arg Ser Asn Asn Leu Ser Phe Val Asn Val Asn Asp Asn Asn Tyr	
35 40 45	

aag tct aat ccc tgt aaa ttg agt tgt ggg tcc ctt tcg atg ggt gct	252
Lys Ser Asn Pro Cys Lys Leu Ser Cys Gly Ser Leu Ser Met Gly Ala	
50 55 60	

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Gly Phe Ala Arg Leu Gly Leu Asp His Val Met Lys Ser Ser Pro Lys	
65 70 75 80	
tac aga tca gtc aag gct caa gct gct tct gga gga gat ctt gaa gat	348
Tyr Arg Ser Val Lys Ala Gln Ala Ala Ser Gly Gly Asp Leu Glu Asp	
85 90 95	
gcc act cct gtc aaa tat caa ggc aaa tct tct gca tca gtg ttg ccg	396
Ala Thr Pro Val Lys Tyr Gln Gly Lys Ser Ser Ala Ser Val Leu Pro	
100 105 110	
tat gtt ggt gtt gct tgt ttg gga gct att ttg ttt gga tat cac ctt	444
Tyr Val Gly Val Ala Cys Leu Gly Ala Ile Leu Phe Gly Tyr His Leu	
115 120 125	
ggt gtg gta aat gga gct ctt gac tac cta tct gcg gat tta gct att	492
Gly Val Val Asn Gly Ala Leu Asp Tyr Leu Ser Ala Asp Leu Ala Ile	
130 135 140	
gct ggc aat act gtt tta caa gga tgg gtt gtg agc ata tta ctt gct	540
Ala Gly Asn Thr Val Leu Gln Gly Trp Val Val Ser Ile Leu Leu Ala	
145 150 155 160	
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Gly Ala Thr Val Gly Ser Phe Thr Gly Gly Ser Leu Ala Asp Lys Phe	
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gga agg aca aag acc ttc cag tta gat gca att cct ctt gca ata gga	636
Gly Arg Thr Lys Thr Phe Gln Leu Asp Ala Ile Pro Leu Ala Ile Gly	
180 185 190	
gct tat ctc tgt gcc aca gca caa aat gta cag ata atg atg att ggt	684
Ala Tyr Leu Cys Ala Thr Ala Gln Asn Val Gln Ile Met Met Ile Gly	
195 200 205	
cgt tta ctt tgt ggc att gga att ggc ata tca tct gcc tta gtt ccg	732
Arg Leu Leu Cys Gly Ile Gly Ile Ser Ser Ala Leu Val Pro	
210 215 220	
tta tac att tct gag att tcg cca act gaa att cga ggt gca ctt ggt	780
Leu Tyr Ile Ser Glu Ile Ser Pro Thr Glu Ile Arg Gly Ala Leu Gly	
225 230 235 240	
tct gtc aac cag ctt ttt ata tgc att ggt att ctt gcg gct ttg gtt	828
Ser Val Asn Gln Leu Phe Ile Cys Ile Gly Ile Leu Ala Ala Leu Val	
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gct gga ttg cct tta gca gga aac cct ttg tgg tgg agg aca atg ttt	876
Ala Gly Leu Pro Leu Ala Gly Asn Pro Leu Trp Trp Arg Thr Met Phe	
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Gly Ile Ala Thr Val Pro Ser Val Leu Leu Ala Leu Gly Met Gly Phe	
275 280 285	
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Cys Pro Glu Ser Pro Arg Trp Leu Phe Gln Gln Gly Lys Ile Val Glu	
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Ala Glu Lys Ala Val Ala Leu Tyr Gly Lys Glu Arg Val Pro Glu	

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Val Ile Asn Asp Leu Arg Ala Ser Val Gln Gly Ser Ser Glu Pro Glu				
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Ala Gly Trp Phe Asp Leu Phe Ser Ser Arg Tyr Arg Lys Val Val Ser				
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Val Gly Ala Ala Leu Phe Leu Phe Gln Gln Met Ala Gly Ile Asn Ala				
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Val Val Tyr Tyr Ser Thr Ser Val Phe Arg Ser Ala Gly Ile Ala Ser				
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gat gtt gcc gct agt gcc ctt gtt gga gca tca aat gtt att ggc act				1260
Asp Val Ala Ala Ser Ala Leu Val Gly Ala Ser Asn Val Ile Gly Thr				
385		390		395
400				
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Ala Val Ala Ser Ser Leu Met Asp Lys Gln Gly Arg Lys Ser Leu Leu				
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atg aca agt ttc tca gga atg gct gcc tca atg ttg ttg ctg tca cta				1356
Met Thr Ser Phe Ser Gly Met Ala Ala Ser Met Leu Leu Leu Ser Leu				
420		425		430
tcg ttc aca tgg aag gct cta gca cct tac tcg ggc aca ctt gcc gtt				1404
Ser Phe Thr Trp Lys Ala Leu Ala Pro Tyr Ser Gly Thr Leu Ala Val				
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gtg gga act gtt tta tat gtc ctt tcc ttt tca ctt ggc gct ggt cct				1452
Val Gly Thr Val Leu Tyr Val Leu Ser Phe Ser Leu Gly Ala Gly Pro				
450		455		460
gtt cct gct ctt cta ctt cca gag atc ttc gca tcc aga atc cga gca				1500
Val Pro Ala Leu Leu Pro Glu Ile Phe Ala Ser Arg Ile Arg Ala				
465		470		475
480				
aaa gca gtg gct ttg tca ctg gga atg cat tgg gcg tca aac ttc gta				1548
Lys Ala Val Ala Leu Ser Leu Gly Met His Trp Ala Ser Asn Phe Val				
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att ggc ctt tat ttc tta agt gtg gtg acc aag ttt gga atc agc aaa				1596
Ile Gly Leu Tyr Phe Leu Ser Val Val Thr Lys Phe Gly Ile Ser Lys				
500		505		510
gtg tat ttg ggg ttc gcg tca gtg tgt gtg ctt gcc gtg ttg tac ata				1644
Val Tyr Leu Gly Phe Ala Ser Val Cys Val Leu Ala Val Leu Tyr Ile				
515		520		525
gct ggt aac gtt gtt gaa aca aaa gga cga tca ctt gag gaa ata gag				1692
Ala Gly Asn Val Val Glu Thr Lys Gly Arg Ser Leu Glu Glu Ile Glu				
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ctt gct cta agt cca gct gtt tag tttggaggat acagtttttc tggttttttg				1746
Leu Ala Leu Ser Pro Ala Val				
545		550		
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<400> 6
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35 40 45
Lys Ser Asn Pro Cys Lys Leu Ser Cys Gly Ser Leu Ser Met Gly Ala
50 55 60
Gly Phe Ala Arg Leu Gly Leu Asp His Val Met Lys Ser Ser Pro Lys
65 70 75 80
Tyr Arg Ser Val Lys Ala Gln Ala Ala Ser Gly Gly Asp Leu Glu Asp
85 90 95
Ala Thr Pro Val Lys Tyr Gln Gly Lys Ser Ser Ala Ser Val Leu Pro
100 105 110
Tyr Val Gly Val Ala Cys Leu Gly Ala Ile Leu Phe Gly Tyr His Leu
115 120 125
Gly Val Val Asn Gly Ala Leu Asp Tyr Leu Ser Ala Asp Leu Ala Ile
130 135 140
Ala Gly Asn Thr Val Leu Gln Gly Trp Val Val Ser Ile Leu Leu Ala
145 150 155 160
Gly Ala Thr Val Gly Ser Phe Thr Gly Gly Ser Leu Ala Asp Lys Phe
165 170 175
Gly Arg Thr Lys Thr Phe Gln Leu Asp Ala Ile Pro Leu Ala Ile Gly
180 185 190
Ala Tyr Leu Cys Ala Thr Ala Gln Asn Val Gln Ile Met Met Ile Gly
195 200 205
Arg Leu Leu Cys Gly Ile Gly Ile Gly Ser Ser Ala Leu Val Pro
210 215 220
Leu Tyr Ile Ser Glu Ile Ser Pro Thr Glu Ile Arg Gly Ala Leu Gly
225 230 235 240
Ser Val Asn Gln Leu Phe Ile Cys Ile Gly Ile Leu Ala Ala Leu Val
245 250 255
Ala Gly Leu Pro Leu Ala Gly Asn Pro Leu Trp Trp Arg Thr Met Phe
260 265 270
Gly Ile Ala Thr Val Pro Ser Val Leu Leu Ala Leu Gly Met Gly Phe
275 280 285

Cys Pro Glu Ser Pro Arg Trp Leu Phe Gln Gln Gly Lys Ile Val Glu
290 295 300

Ala Glu Lys Ala Val Ala Ala Leu Tyr Gly Lys Glu Arg Val Pro Glu
305 310 315 320

Val Ile Asn Asp Leu Arg Ala Ser Val Gln Gly Ser Ser Glu Pro Glu
325 330 335

Ala Gly Trp Phe Asp Leu Phe Ser Ser Arg Tyr Arg Lys Val Val Ser
340 345 350

Val Gly Ala Ala Leu Phe Leu Phe Gln Gln Met Ala Gly Ile Asn Ala
355 360 365

Val Val Tyr Tyr Ser Thr Ser Val Phe Arg Ser Ala Gly Ile Ala Ser
370 375 380

Asp Val Ala Ala Ser Ala Leu Val Gly Ala Ser Asn Val Ile Gly Thr
385 390 395 400

Ala Val Ala Ser Ser Leu Met Asp Lys Gln Gly Arg Lys Ser Leu Leu
405 410 415

Met Thr Ser Phe Ser Gly Met Ala Ala Ser Met Leu Leu Leu Ser Leu
420 425 430

Ser Phe Thr Trp Lys Ala Leu Ala Pro Tyr Ser Gly Thr Leu Ala Val
435 440 445

Val Gly Thr Val Leu Tyr Val Leu Ser Phe Ser Leu Gly Ala Gly Pro
450 455 460

Val Pro Ala Leu Leu Leu Pro Glu Ile Phe Ala Ser Arg Ile Arg Ala
465 470 475 480

Lys Ala Val Ala Leu Ser Leu Gly Met His Trp Ala Ser Asn Phe Val
485 490 495

Ile Gly Leu Tyr Phe Leu Ser Val Val Thr Lys Phe Gly Ile Ser Lys
500 505 510

Val Tyr Leu Gly Phe Ala Ser Val Cys Val Leu Ala Val Leu Tyr Ile
515 520 525

Ala Gly Asn Val Val Glu Thr Lys Gly Arg Ser Leu Glu Glu Ile Glu
530 535 540

Leu Ala Leu Ser Pro Ala Val
545 550